

## Earth Science : Plate Tectonics Review Sheet

### Essential Knowledge and Skills

- Earth consists of a solid, mostly iron inner core; a liquid, mostly iron outer core; a rocky, plastic mantle; and a rocky, brittle crust.
- Relative plate motions and plate boundaries are convergent (subduction and continental collision), divergent (sea-floor spreading), or transform.
- Ocean crust is relatively thin, young, and dense.
- Continental crust is relatively thick, old, and less dense.
- Continental drift is a consequence of plate tectonics.
- Earthquake activity is associated with all plate boundaries.
- Major features of divergent boundaries include mid-ocean ridges, rift valleys, and fissure volcanoes.
- in Earth's crust along which movement has occurred.
- Most active faults are located at or near plate boundaries. Earthquakes result when movement occurs along a fault.
- A volcano is an opening where magma is erupted onto Earth's surface. Most volcanic activity is associated with subduction, rifting or sea-floor spreading.

### Important Words You Need to Know:

**converging or convergent boundary** – a boundary that forms when two lithospheric plates come together, or converge (collide)

**crust** – thin, outermost layer of the Earth

**divergent boundary** – also called a spreading center; where two adjacent plates are moving away from each other

**earthquakes** – vibrations caused by the sudden movement of Earth's crust

**inner core** – solid, innermost center of the Earth

**lithosphere** – outer solid shell of Earth that extends to a depth of about 100 kilometers

**mantle** – layer of the Earth that extends from the bottom of the crust to the outer core

**mid-ocean ridge** – undersea mountain chain where new ocean floor is produced; a constructive (divergent) plate boundary

**outer core** – layer of the Earth surrounding the inner core; liquid iron and nickel

**plate tectonics** – theory of the formation and movement of the rigid pieces, or plates, that cover Earth's surface explains movements

of continents and changes in Earth's crust caused by internal forces

**sea floor spreading** – the production of new ocean crust along a mid-ocean ridge/rift system that moves older seafloor away from the ridge enlarging the ocean basin and separating continents

**subduction** – process in which crust plunges back into Earth's interior

**volcano** – an opening in Earth's crust through which an eruption takes place

### Rock and Mineral Identification:

- **Bowen's Reaction Series** - continuous v. noncontinuous, relationship between temperature, rock crystallization and rock type (mafic - felsic)
- **Igneous Rocks** - mafic v. felsic, intrusive v. extrusive
- **Sedimentary Rocks** - clastic, chemical, organic
- **Metamorphic Rocks** - foliated v. non-foliated

### Questions to Consider:

1. Who is Alfred Wegener and what is his theory of Plate Tectonics? What evidence exists to support this theory today?
2. What is Pangea?
3. How do we calculate seafloor spreading?
4. How do we identify a rock as metamorphic, igneous or sedimentary? Where would you expect to find each type of rock and why?
5. What are the 3 types of plate boundaries? What geologic features do we find at each location?
6. Explain Bowen's Reaction Series.

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### Format of the Quiz:

- 20% multiple choice
- 20% fill in the blank
- 20% calculating seafloor spreading
- 20% short answer
- 20% analyzing graphs and pictures

### 25 Points Total

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### Study Strategies:

- Review notes, lab and homework assignments
- Analyze major diagrams in the textbook
- Review Seafloor Spreading diagram and Bowen's Reaction Series

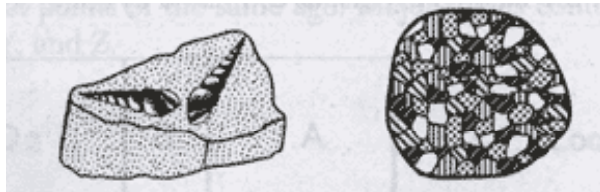
## Practice Questions!

1. Which sample best shows the properties normally associated with rocks found at a convergent boundary?



A

C



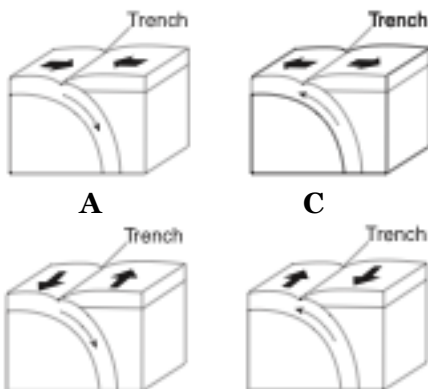
B

D

2. The Rocky Mountains have been created by which type of boundary?

- A Convergent
- B Divergent
- C Spreading center
- D Transform

3. In which diagram do the arrows best represent the motions of Earth's crust at an ocean trench?



A

C

B

D

4. What geologic features would you expect to find in picture A?

5. In which picture above would you expect to find lots of earthquakes?

6. Choose one picture above that is not an accurate representation of a plate boundary and explain why.

Base your answers to the next two

questions, on the map below of Iceland, a country located on the Mid-Atlantic Ridge.

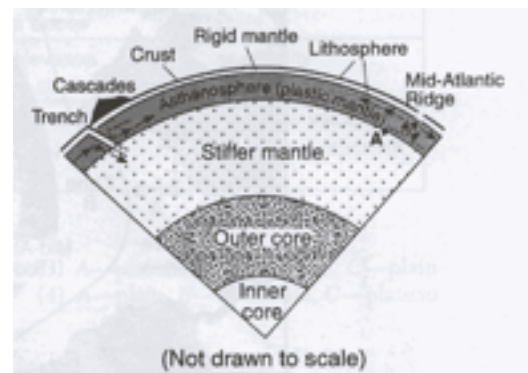


7. The fine-grained texture of most of the igneous rock formed on the surface of Iceland is due to-

- A rapid cooling of the molten rock
- B high density of the molten rock
- C numerous faults in the island's bedrock
- D high pressure under the island

8. Who is the scientist attributed with the concept of Pangea? Who is the scientist who first developed the Theory of Seafloor Spreading?

9. The arrows shown in the asthenosphere represent the slow circulation of the plastic mantle by a process called:



- A. insolation
- B. convection
- C. conduction
- D. radiation

10. Compared to felsic igneous rocks, mafic igneous rocks contain greater amounts of

- 1. white quartz
- 2. aluminum
- 3. pink feldspar
- 4. iron